6692 G-000-1006.110

PROGRESS REPORT - OPERABLE UNIT 5 - ENVIRONMENTAL MEDIAL - MARCH 1995

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Remedial Investigation/ Feasibility Study

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Operable Unit 5
ENVIRONMENTAL MEDIA

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Introduction

The Remedial Investigation/Feasibility Study (RI/FS) is the blueprint for cleanup at the U.S. Department of Energy's Fernald Environmental Management Project. The nature and extent of contamination at the Fernald site and surrounding areas is being thoroughly investigated so that appropriate remedial actions can be formulated and implemented.

The Fernald site has been divided into five sections, known as Operable Units, for environmental investigation and cleanup. The Operable Units were defined based on their location or the potential for similar technologies to be used in the ultimate cleanup.

During the course of the RI/FS effort, certain conditions are occasionally identified which call for more immediate action. These actions are called "removal actions" and are initiated when there is a need to accelerate cleanup activities to address releases or potential releases of hazardous substances. Removal actions are coordinated with the U.S. EPA and the Ohio EPA.

Following is a progress report on Operable Unit 5 including its history, the current status of RI/FS activities, cleanup alternatives under consideration, and work being done to alleviate near-term concerns.

Background

Operable Unit 5 encompasses the environmental media at the Fernald site and surrounding areas. While other Operable Units focus on specific waste facilities or defined areas, Operable Unit 5 is concerned with those environmental media that could be affected by the Fernald site. "Environmental media" includes the groundwater including perched water, surface water, soils, sediments, vegetation and wildlife throughout the Fernald site and surrounding areas. The groundwater includes the Great Miami Buried Valley Aquifer, a source of groundwater used for drinking water in the vicinity of the Fernald site. Surface waters include the Great Miami River, Paddy's Run, and the Fernald site's storm sewer outfall ditch. Sediments in Operable Unit 5 include solid materials carried in stormwater runoff or plant effluent discharges to surface waters or drainage ditches. Soils on and off the Fernald property boundaries also are being investigated for possible contamination due to past discharges or air emissions.

RI/FS Activities

Remedial Investigation Report: The Remedial Investigation (RI) report was approved by U.S. EPA and Ohio EPA in February 1995. The final RI report incorporating U.S. EPA and Ohio EPA comments was issued in mid-March 1995.

Feasibility Study/Proposed Plan Report: The draft Operable Unit 5 Feasibility Study/Proposed Plan for Remedial Action (FS/PP) report, including data generated from treatability studies, was submitted to U.S. EPA and Ohio EPA in November 1994, for review. DOE and FERMCO addressed EPA comments on the FS/PP report in December 1994 and January 1995. The draft final FS/PP report, reflecting changes made to incorporate EPA comments, will be resubmitted to U.S. EPA and

Ohio EPA in mid-March 1995, for final review.

Eleven remedial alternatives ranging from no action to full restoration of all affected environmental media are considered in the FS report. Each of the alternatives was subjected to detailed evaluation against a series of criteria including effectiveness, cost, and implementability. On the basis of these evaluations, the DOE identified a preferred remedy in the draft Proposed Plan. The DOE's preferred remedy is comprised of the following key elements:

* Excavation of contaminated soil and sediment that exceed proposed final remediation levels using conventional excavation equipment, and placement of the excavated materials in an on-property, above-ground disposal facility.

* Contaminated soil not meeting the waste acceptance criteria for the disposal facility would be shipped to an off-site disposal facility. Soil meeting the waste acceptance criteria would be placed in the on-site disposal facility.

* Extraction and treatment of Great Miami Aquifer groundwater containing concentrations of contaminants above established or proposed maximum concentration levels.

The final Proposed Plan will be issued for public comment following receipt of EPA approval.

DOE is scheduled to submit its proposed draft Record of Decision for Operable Unit 5 to U.S. EPA and Ohio EPA by July 3, 1995.

Removal Actions

Contaminated Water Beneath FEMP Buildings (Removal Action No. 1): This removal action was initiated to minimize the potential for uranium-contaminated groundwater to infiltrate the underlying aquifer from perched water zones located beneath some former production buildings. "Perched" water is present in isolated pockets within the layers of clay-rich glacial soils that exist above the Great Miami Buried Valley Aquifer in the Fernald area.

Perched water zones beneath Plants 2/3, 6, 8, and 9, are of concern due to the discovery of significant concentrations of uranium. In addition, it was determined that these waters also contained volatile organic compounds. To minimize the potential for the movement of contaminated water in these zones to the underlying aquifer, a series of pumping wells were installed to extract the perched groundwater.

A treatment system at Plant 8 comprised of activated carbon filters is being used to remove volatile organic compounds from the extracted water. Following treatment of the water to address the organics, the water is then processed through Fernald's new Advanced Wastewater Treatment system for the removal of uranium before discharge to the Great Miami River.

South Groundwater Contamination Plume (Removal Action No. 3): The purpose of this removal action is to protect public health by limiting access to the use of uranium-contaminated groundwater in an area south of the Fernald site. This removal action is broken into five parts.

Part 1 provides an alternate water source to an industry affected by the contamination plume. This portion of the project involved the installation of production wells outside the plume area and a water supply system to the affected industry. The system has been in operation since 1992.

Another affected industry, which uses a minimal amount of groundwater (currently using bottled water for drinking purposes), will be provided with an alternate water supply by being connected to the public water system which is now under construction.

Part 2 involves the installation of a hydraulic barrier to impede further migration of the off-property South Plume. This is accomplished via a groundwater recovery well system to extract and pump groundwater from the plume. The extracted water is transported through a force main pipeline back to the Fernald site for monitoring and subsequent discharge to the Great Miami River. The groundwater recovery well system has been operational since August 1993.

A new effluent outfall pipeline also was installed under Part 2. The new outfall pipeline parallels the original outfall pipeline to the Great Miami River. To address the low dissolved

oxygen content of the extracted groundwater, an aeration facility also was constructed under Part 2.

Part 3 involved construction of an Interim Advanced Wastewater Treatment (IAWWT) system which is now operational. The advanced treatment provided by the IAWWT system removes additional uranium from existing site wastewater streams.

Part 4 of the removal action involves groundwater monitoring and institutional controls to prevent the use of contaminated groundwater. This ongoing activity is being implemented through the Fernald site's existing Groundwater Monitoring Program, including frequent monitoring of private wells located near areas of known contamination.

Part 5 involved additional groundwater investigations in the vicinity of the South Plume to identify the location and extent of any remaining contamination attributable to Fernald in the groundwater south (downgradient) of the recovery wells installed under Part 2.

Results from the Part 5 sampling indicate that the South Plume Recovery System is effectively containing the leading edge of the plume (groundwater exceeding 20 ppb of total uranium). Additionally, continuous monitoring of these wells has indicated that the recovery well system is not adversely impacting the Paddy's Run Road Site contaminant plume.

Advanced Wastewater Treatment System: Construction of the Advanced Wastewater Treatment (AWWT) system was completed on schedule and the facility became operational in January 1995 as planned. The objective of the AWWT is to provide advanced treatment of stormwater runoff and wastewaters for the removal of radionuclides prior to discharge from the Fernald site.

In addition, preliminary engineering examining the viability of expanding the AWWT system to address groundwater removed as part of future remedial actions has been completed. These preliminary engineering efforts supported development of the Operable Unit 5 Feasibility Study. More detailed engineering on the expansion of the AWWT to address future groundwater remedial actions is now in progress.

Other Activities

Supplemental Environmental Project: DOE agreed to conduct a Supplemental Environmental Project with the objective of further reducing uranium discharges from the Fernald site to the Great Miami River. As part of this project, one additional Interim Advanced Wastewater Treatment unit was installed to treat 200 gallons per minute (gpm) of extracted South Plume groundwater. This system became operational in March 1994.

In addition, the lifespan of the existing IAWWT unit at the Stormwater Retention Basin will be extended and this unit will be converted to treat additional South Plume water. In March 1995, the treatment capacity of this unit will be increased from 300 gpm to 400 gpm. This effort is intended to further reduce uranium discharges.

Under the terms of the Supplemental Environmental Project agreement, Fernald also will utilize the AWWT for South Plume water treatment when excess capacity is available. This measure is expected to provide an additional average of 550 gpm of treatment capacity, and further reduce uranium discharges to the river.

For More Information

More information about Operable Unit 5 is available in the Public Environmental Information Center (PEIC), where Fernald Project cleanup documents are kept in the Administrative Record. The PEIC is located in the JAMTEK building, 10845 Hamilton-Cleves Highway, Harrison, Ohio, 45030. The telephone number is (513) 738-0164.